

Supplementary Table S1. List of published sequences for molecular analyses.

Species	Voucher	Collection information	cox1	rbcL
<i>Capreolia implexa</i> Guiry & Womersley	CNU056136	Shelly Beach, Warrnambool, Australia	KM204060	KM204081
<i>Gelidiophycus freshwateri</i> G.H.Boo, J.K.Park & S.M.Boo	CNU049947	Daecheon, Boryeong, Korea	JX891571	JX891603
<i>Gelidiorariphycus loratus</i> Iha, S.M.Guimarães, Freshwater & M.C.Oliveira	IBC0256	On shallow subtidal rocks, Queimada Grande Island (Snake Island), Itanhaém, São Paulo, Brazil; 19.iv.2010	KT208020	KT208109
<i>Gelidium abbottiorum</i> R.E. Norris	CNU026103 (G2253)	Rocky Bay, Duran, KwaZulu-Natal, South Africa	KT920390	-
<i>Gelidium abbottiorum</i>	SA04-109	Shelly Beach, KwaZulu-Natal, South Africa	-	EF190254
<i>Gelidium adriaticum</i> C.Perrone, A.Bottalico, G.H.Boo & S.M.Boo	BAGR2591	Torre a Mare, Bari, Apulia, Italy; 25.ix.2012	KU958469	KU958475
<i>Gelidium americanum</i> (W.R.Taylor) Santelices	SP469081	Pedra do Sal, Luis Correia, Brazil; 26.vi.2013	KX574741	KX555615
<i>Gelidium arborescens</i> N.L.Gardner	UC93582	Carmel Bay, Monterey County, California, USA; 17.v.1897	NC_031836	KX423474
<i>Gelidium asperum</i> (C.Agardh) Greville	CNU037655	Nora Creina Bay, Australia	JX891567	-
<i>Gelidium asperum</i>	PtLons2	Point Lonsdale, Victoria, Australia	-	AY350782
<i>Gelidium attenuatum</i> (Turner) Thuret	-	Aramar, Asturias, Spain	-	U00110
<i>Gelidium australe</i> J.Agardh	GausPtMac-2	Port McDonnell, South Australia, Australia	KT920391	AY350783
<i>Gelidium bernabei</i> A.J.K.Millar & D.W.Freshwater	NSW-5	Gordons Bay, Clovelly, New South Wales, Australia	KT920392	AY352419
<i>Gelidium brasiliense</i> Brunelli, Boo & M.T.Fujii	SP470211	Castelhanos Beach, Anchieta, Espirito Santo, Brazil; 4.x.2017	MH538513	MH538512
<i>Gelidium calidum</i> Jamas, Iha & Fujii	SP469077	Jauá Beach, Camaçari, Brazil; 23.v.2013	KX574739	KX555613
<i>Gelidium canariense</i> (Grunow) Seoane Camba ex Haroun, Gil-Rodriguez, Diaz de Castro & Prud'homme van Reine	-	Puerto de la Cruz, Tenerife, Canary Islands	-	L22460

<i>Gelidium capense</i> (S.G. Gmelin) P.C. Silva	CNU026109	Clovelly, False Bay, Western Cape Prov., South Africa	HM629858	HM629818
<i>Gelidium carolinianum</i> C.Perrone, D.W.Freshwater, A.Bottalico, G.H.Boo & S.M.Boo	BAGR12109	Torre a Mare, Bari, Apulia, Italy; Oct 12, 2011	KU564063	KU564068
<i>Gelidium chilense</i> (Montagne) Santelices & Montalva	-	Punta Lengua de Vaca, Tongoy Bay, Coquimbo, Chile	-	AF305800
<i>Gelidium coreanum</i> K.M.Kim, I.K.Hwang, H.S.Yoon & S.M.Boo	CNU000127	Youngjin, Gangneung, Korea	JQ340419	JQ340391
<i>Gelidium corneum</i> (Hudson) J.V.Lamouroux	CNU026111	Morocco	HM629861	HM629821
<i>Gelidium coulteri</i> Harvey	CNU026167	Agate Beach, California, USA	HM629862	HM629822
<i>Gelidium crinale</i> (Hare ex Turner) Gaillon	G6292	Sidmouth, UK	JX096542	JX096520
<i>Gelidium declerckii</i> Tronchin	S14	Nahoon Point, East London, Eastern Cape Prov., South Africa	KT920394	AY350775
<i>Gelidium elegans</i> Kützing	CNU052319	Seogechoado, Jindo, Korea	HM629869	HM629829
<i>Gelidium eucorneum</i> K.M.Kim, I.K.Hwang, J.K.Park & S.M.Boo	CNU054478	Hakdong, Geoje, Korea	HM629854	HM629815
<i>Gelidium floridanum</i> W.R. Taylor	SP428877	Joaquina Beach, Florianopolis, Santa Catarina, Brazil; 16.xi.2013	MF577006	MF565762
<i>Gelidium foliaceum</i> (Okamura) E.M.Tronchin	GfolSA3	Breezy Point, Eastern Cape Prov., South Africa	HQ412456	-
<i>Gelidium foliaceum</i>	OfolBP	East London, Eastern Cape Prov., South Africa	-	AF501285
<i>Gelidium gabrielsonii</i> Hughey & G.H.Boo	UC2050580	Hopkins Marine Station, Pacific Grove, Monterey County, California, USA; Jun 8, 2017	MG922859	MG922860
<i>Gelidium galapagense</i> W.R.Taylor	UC1884224	Banks Bay, Isla Isabela, Galápagos Islands, Ecuador; Jan 13, 1934	NC_031837	KX423476
<i>Gelidium gonzalezii</i> D.Rodríguez, Quiroz- González & Ponce-Márquez	PTM 10850	Las Cuatas, Guerrero, Mexico	MN346977	MN346968

<i>Gelidium guimaraesiae</i> Brunelli, Milstein, Boo & M.T.Fujii	SP428772	Castelhanos Beach, Anchieta, Espirito Santo, Brazil; 22.vi.2013	MF577009	MF565764
<i>Gelidium honghaiwanense</i> G.C.Wang & X.L.Wang	SW6-1	Shanwei, honghaiwan, China; iv.2015	KY437752	KY437737
<i>Gelidium indonesianum</i> K.M.Kim, G.S.Gerung & S.M.Boo	CNU024717	Java Island, Indonesia	JF330200	JF330216
<i>Gelidium isabelae</i> W.R.Taylor	UC1884226	Albemarle, Isla Isabela, Galápagos Islands, Ecuador; Jan 12, 1934	NC_031838	KX423477
<i>Gelidium japonicum</i> (Harvey) Okamura	CNU051978	Choshi, Chiba, Japan	HM629870	HM629830
<i>Gelidium jejuense</i> K.M.Kim, I.K.Hwang, H.S.Yoon & S.M.Boo	CNU011862	Jongdal, Jeju, Korea	JQ340445	JQ340406
<i>Gelidium johnstonii</i> Setchell & N.L.Gardner	CNU002155	Munseom, Jeju, Korea	KF384128	KF381386
<i>Gelidium kathyanniae</i> G.H.Boo & Hughey	UC2026076	Dana Point, Orange County, California, USA; Dec 12, 2012	MH780743	MH780750
<i>Gelidium latifolium</i> Bornet ex Hauck	-	Plouguerneau, Brittany, France	-	U01818
<i>Gelidium lineare</i> Iha & Freshwater	IBC0557	Praia dos Castelhanos, Anchieta, Espirito Santo, Brazil; May 5, 2012	KT208030	KT208118
<i>Gelidium linoides</i> Kützinger	-	Shirahama, Shimoda, Shizuoka Pref., Japan	-	AB030622
<i>Gelidium longiramulosum</i> (Y.P.Lee & B.S.Kim) G.H.Boo	A331	Geomundo, Yeosu, Korea	HM629882	HM629842
<i>Gelidium maggsiae</i> Rico & Guiry	-	Concha de Artedo, Asturias, Spain	-	KC192648
<i>Gelidium microdon</i> Kützinger	CNU025583	Tarifa, Cadiz, Spain	KT920396	KT920271
<i>Gelidium microdenticum</i> W.R.Taylor	SP469069	Encantadas, Ilha do Mel, PR, Brazil; Jul 12, 2014	KX574735	KX555611
<i>Gelidium microglossum</i> A.L.Grusz & Freshwater	WNC20957	Playa Brasilito, Guanacaste, Costa Rica; Oct 5, 2000	KC288160	KC192649

<i>Gelidium microphyllum</i> (Crosby-Smith) Kylin	MATS300	Wharekauni, Chatham Island, New Zealand	KT920397	-
<i>Gelidium microphyllum</i>	-	Ringaringa Beach, Stewart Island, New Zealand; Oct 9, 1998	-	AY648022
<i>Gelidium micropterum</i> Kützing	Nightingale 2010 023	Seal Pool and nearby shore, Nightingale, Saint Helena; 21.iii.2010	MK202369	MK185763
<i>Gelidium millarianum</i> G.H.Boo, Hughey, K.A.Miller & S.M.Boo	CNU056286	Gordon's Bay, Sydney, Australia; Jan 23, 2014	KX423467	KX423484
<i>Gelidium minimum</i> K.M.Kim, I.K.Hwang, H.S.Yoon & S.M.Boo	CNU002165	Beomsum, Jeju, Korea	JQ340447	-
<i>Gelidium minimum</i>	CNU011894	Beomsum, Jeju, Korea	-	JQ340411
<i>Gelidium omanense</i> M.J.Wynne	CNU000130	Raaha Bay, Dhofar, Oman	JX891569	-
<i>Gelidium omanense</i>	Wynne 1609-2000-09-36	Hatom Cove, East of Mirbat, Dhofar, Oman	-	AY346460
<i>Gelidium pacificum</i> Okamura	CNU051985	Chiba University Marine Station, Japan	HM629871	HM629831
<i>Gelidium pakistanicum</i> (Afaq-Husain & Shameel) Shahnaz & Freshwater	WNC:22843	Paradise Point, Karachi, Pakistan; Dec 20, 2014	MK497727	MK497735
<i>Gelidium palmatum</i> G.H.Boo & K.M.Kim	CNU059010	Donggori, Wando, Korea; 14.vii. 2014	MN784142	-
<i>Gelidium palmatum</i>	CNU059012	Donggori, Wando, Korea; 14.vii. 2014	-	MN784150
<i>Gelidium pluma</i> Bornet ex N.H.Loomis	ARS00824	Hawaii, USA	HQ422688	-
<i>Gelidium pluma</i>	-	Hilo, Hawaii, USA	-	AF522367
<i>Gelidium pristoides</i> (Turner) Kützing	CNU053084	Dalebrook, Flase Bay, Western Cape Prov., South Africa	HM629874	HM629834
<i>Gelidium profundum</i> Tronchin & Freshwater	S04-129	Protea Banks Reef, KwaZulu-Natal, South Africa	-	EF190251
<i>Gelidium prostratum</i> K.M.Kim, I.K.Hwang, H.S.Yoon & S.M.Boo	CNU011878	Euihang, Taeon, Korea	JQ340456	-
<i>Gelidium prostratum</i>	CNU010848	Euihang, Taeon, Korea	-	JQ340415

<i>Gelidium pteridifolium</i> R.E. Norris, Hommersand & Fredericq	SA04-110	Shelly Beach, KwaZulu-Natal, South Africa	-	EF190253
<i>Gelidium pulchellum</i> (Turner) Kützing	G6278	Ilfracombe Harbour, Ilfracombe, UK	JX891570	-
<i>Gelidium pulchellum</i>	-	Graveyard Beach, Co. Galway, Ireland	-	U01969
<i>Gelidium purpurascens</i> N.L.Gardner	CNU026162	Agate Beach, California, USA	HM629873	HM629833
<i>Gelidium pusillum</i> (Stackhouse) Le Jolis	CNU026677	Les Algues, Lion sur-mer, Caen, France	HM629872	HM629832
<i>Gelidium rex</i> Santelices & I.A.Abbott	CNU026315	Punta Lengua de Vaca, Tongoy Bay, Coquimbo, Chile	HM629875	HM629835
<i>Gelidium robustum</i> (N.L.Gardner) Hollenberg & I.A.Abbott	CNU024833	Natividad Island, Baja California Sur, Mexico	HM629876	HM629836
<i>Gelidium rosulatum</i> G.H.Boo, J.K.Park, K.S.Han & H.S.Yoon	SKK003974	Gajebawi Rock, Ulleungdo, Korea; 13.v.2017	OK665775	OK665782
<i>Gelidium sanyaense</i> G.C.wang & X.I.Wang	FCG2-1	Guaishitan, Fangchenggang, Guangxi, China; Oct 18, 2016	KY494659	KY494676
<i>Gelidium sclerophyllum</i> W.R.Taylor	WNC20891	Montezuma, Guanacaste, Costa Rica; 1.x.2000	KC288159	KC192651
<i>Gelidium sclerophyllum</i>	PHY4514	Near Mono Feliz, Punta Burica, Chiriqui, Panama; 8.i.2011	KY656556	-
<i>Gelidium sclerophyllum</i>	PHY4629	Southwest side of Isla Burica, Punta Burica, Chiriqui, Panama; 10.i.2011	-	KY573959
<i>Gelidium sclerophyllum</i>	PHY4645	Southwest side of Isla Burica, Punta Burica, Chiriqui, Panama; 10.i.2011	KY656557	KY573996
<i>Gelidium sclerophyllum</i>	CFES 079	La Libertad, La Vega, El Salvador; 28.i.2009	MN336343	-
<i>Gelidium sclerophyllum</i>	ARS02710	Hawaii, USA	HQ422595	-
<i>Gelidium sclerophyllum</i>	ARS02711	Hawaii, USA	HQ422596	-
<i>Gelidium sentosaense</i> G.H.Boo, Y.Cai & S.M.Boo	CNU031026	Sentosa Island, Singapore	KU512774	KY494676

<i>Gelidium serrulatum</i> J.Agardh	-	Mochimo, Sucre, Venezuela	-	U01042
<i>Gelidium spinosum</i> (S.G.Gmelin) P.C.Silva	CNU025526	Muros, A Coruña, Spain	HM629877	HM629837
<i>Gelidium tenuifolium</i> Shimada, Horiguchi & Masuda	-	Shizuoka, Shimoda, Japan	-	AB030624
<i>Gelidium usmanghanii</i> Afaq-Husain & M.Shameel	#1109-2000-04-33	Raaha (=Alto) Bay, east of Wadi Zeid and east of Mirbat, Dhofar, Oman; 11.ix.2000	-	AY346463
<i>Gelidium vagum</i> Okamura	CNU049025	Heuksando, Shinan, Korea	HM629879	HM629840
<i>Gelidium vittatum</i> (Linnaeus) Kützinger	-	Lüderitz, Namibia	-	AF501289
<i>Gelidium yangmeikengense</i> G.C.Wang & X.L.Wang	SZ14-3	Yangmeikeng, Shenzhen, Guangdong, China; 20.iv.2015	KY494661	KY494680
<i>Ptilophora spongiophila</i> G.H.Boo, L.Le Gall, I.K.Hwang, K.A.Miller & S.M.Boo	PC0171941	Cap Sainte Marie, Madagascar; May 22, 2010	MG066721	MG066747

Dash (-) indicates not applicable.